WHAT IS CLAIMED IS:

1. An engine air intake manifold comprising:

a first main body section having a first mating part; and

a second main body section having a second mating part that is fixedly coupled to the first mating part to form an air intake passage therebetween,

the first and second mating parts of the first and second main body sections being configured and arranged to be divided along an airflow direction of the air intake passage with a gas passage being formed by the first and second mating parts in the airflow direction of the air intake passage and the gas passage opening into a downstream portion of the air intake passage to supply a secondary additive gas thereto.

2. The engine air intake manifold according to claim 1, wherein

the first and second main body sections are configured to form an air intake branch part having a plurality of air intake branch passages, each of the air intake branch passages being formed between the first and second main body sections.

3. The engine air intake manifold according to claim 2, wherein

the gas passage is configured and arranged to slant downwardly from an upstream portion of the first and second main body sections to a downstream portion of the first and second main body sections when the air intake manifold is mounted to an engine main body.

4. The engine air intake manifold according to claim 2, wherein

the first and second main body sections each have a substantially semi-cylindrical air intake passage forming part and a flange part that protrudes radially outward from the air intake passage forming part such that the flange parts of the first and second main body sections form the first and second mating parts with the gas passage.

5. The engine air intake manifold according to claim 4, wherein

the air intake branch part is further equipped with an engine main body mounting flange comprises a first mounting part integrally with the first main body section and a second mounting part being formed integrally with the second main body section.

6. The engine air intake manifold according to claim 5, wherein

the gas passage has first and second passage portions with the first passage portion extending along the first and second flange parts of the first and second main body sections from an upstream end to a downstream end located in a vicinity of the mounting flange, and the second passage portion being arranged to communicate between the downstream end of the first passage portion and the air intake passage.

7. The engine air intake manifold according to claim 2, wherein

the first main body section has a first air intake passage forming part and a first flange part, the first air intake passage forming part comprising a cylindrical part formed integrally with an engine main body mounting flange and a semi-cylindrical part formed so as to continue uninterruptedly toward an upstream side from an end face of the cylindrical part, and the first flange part protruding radially outward from the first air intake passage forming part;

the second main body section has a semi-cylindrical air intake passage forming part and a second flange part protruding radially outward from the semi-cylindrical air intake passage forming part;

the first and second flange parts of the first and second main body sections form the first and second mating parts with the gas passage; and

the air intake passage forming parts defining the air intake passages.

8. The engine air intake manifold according to claim 4, wherein

the flange parts between adjacent pairs of the air intake passages are formed integrally; and

the gas passage formed along the flange parts between the air intake passages are configured to introduce a secondary additive gas into each of the adjacent pairs of the air intake passages.

9. The engine air intake manifold according to claim 2, wherein

one of the first and second main body sections includes a chamber configured and arranged to introduce a secondary additive gas, the chamber being formed on an outside wall of the air intake branch part and extending traversely across the air intake branch passages.

10. The engine air intake manifold according to claim 9, wherein

the chamber includes a frame part formed on the air intake branch part and a lid mounted to the frame part, the frame part defining a transverse space that is fluidly connected with the air intake branch passages.

11. The engine air intake manifold according to claim 9, wherein

the chamber includes a base part and a lid formed with an inside recess, and the lid being mounted to the base part with the inside recess of the lid facing the base part and being fluidly connected with the air intake branch passages.

12. The engine air intake manifold according to claim 2, wherein

the air intake branch part has a valve mounting block disposed in a downstream portion of the air intake branch part; and

the gas passage is further formed by at least a portion of mating surfaces of the air intake branch part and the valve mounting block.

13. The engine air intake manifold according to claim 12, wherein

the gas passage includes a first passage portion formed along the first and second mating parts and a second passage portion continues uninterruptedly to a downstream end face of the valve mounting block and opens into the air intake passages through a third passage portion formed in the downstream end face.

14. The engine air intake manifold according to claim 12, wherein

the gas passage includes a first passage portion formed along the first and second mating parts and an additional passage portion disposed in the air intake branch part and

communicating with the first passage portion, the additional passage portion being defined by an outside surface of the valve mounting block and a groove formed in an inside surface of the air intake branch part.

15. The engine air intake manifold according to claim 12, wherein the gas passage includes a first passage portion formed along the first and second mating parts and an additional passage portion disposed in the air intake branch part and communicating with the first passage portion, the additional passage portion being defined by an inside surface of the air intake branch part and a groove formed in an outside surface of the valve mounting block.

16. The engine air intake manifold according to claim 12, wherein the gas passage includes

a first passage portion formed along the first and second mating parts;

a second passage portion communicating with the first passage portion;

a third passage portion passing from an outside to an inside surface of the air intake branch part;

a fourth passage portion opening to the downstream end face of the air intake branch part and communicating with the second passage portion via the third passage portion; and

a hollow insert having a slit formed along an axial direction and being disposed in the third passage portion such that the downstream sides of the fourth passage portion and the third passage portion are blocked and the fourth passage portion and the second passage portion are connected via the slit.

17. The engine air intake manifold according to claim 16, wherein the fourth passage portion is defined by an outside surface of the valve mounting block and a groove formed in an inside surface of the air intake branch part.

18. The engine air intake manifold according to claim 16, wherein

the fourth passage portion is defined by an inside surface of the air intake branch part and a groove formed in an outside surface of the valve mounting block.

19. The engine air intake manifold according to claim 12, wherein

the gas passage is configured and arranged to slant downwardly from an upstream portion of the first and second main body sections to a downstream portion of the first and second main body sections when the air intake manifold is mounted to an engine main body.

20. The engine air intake manifold according to claim 12, wherein

the first main body section has a first air intake passage forming part and a first flange part, the first air intake passage forming part comprising a cylindrical part formed integrally with an engine main body mounting flange and a semi-cylindrical part formed so as to continue uninterruptedly toward an upstream side from an end face of the cylindrical part, and the first flange part protruding radially outward from the first air intake passage forming part;

the second main body section has a semi-cylindrical air intake passage forming part and a second flange part protruding radially outward from the semi-cylindrical air intake passage forming part;

the first and second flange parts of the first and second main body sections form the first and second mating parts with the gas passage; and

the air intake passage forming parts defining the air intake passages.

21. The engine air intake manifold according to claim 12, wherein

one of the first and second main body sections includes a chamber configured and arranged to introduce a secondary additive gas, the chamber being formed on an outside wall of the air intake branch part and extending traversely across the air intake branch passages.

22. The engine air intake manifold according to claim 21, wherein

the chamber includes a frame part formed on the air intake branch part and a lid mounted to the frame part, the frame part defining a transverse space that is fluidly connected with the air intake branch passages.

23. The engine air intake manifold according to claim 22, wherein

the chamber includes a base part and a lid formed with an inside recess, and the lid being mounted to the base part with the inside recess of the lid facing the base part and being fluidly connected with the air intake branch passages.

24. The engine air intake manifold according to claim 9, wherein

the gas passage is configured and arranged to slant downwardly from an upstream portion of the first and second main body sections to a downstream portion of the first and second main body sections when the air intake manifold is mounted to an engine main body.

25. The engine air intake manifold according to claim 9, wherein

the first and second main body sections each have a substantially semi-cylindrical air intake passage forming part and a flange part that protrudes radially outward from the air intake passage forming part such that the flange parts of the first and second main body sections form the first and second mating parts with the gas passage.

26. The engine air intake manifold according to claim 25, wherein

the air intake branch part is further equipped with an engine main body mounting flange comprises a first mounting part integrally with the first main body section and a second mounting part being formed integrally with the second main body section.

27. The engine air intake manifold according to claim 26, wherein

the gas passage has first and second passage portions with the first passage portion extending along the first and second flange parts of the first and second main body sections from an upstream end to a downstream end located in a vicinity of the mounting

flange, and the second passage portion being arranged to communicate between the downstream end of the first passage portion and the air intake passage.

28. The engine air intake manifold according to claim 9, wherein

the first main body section has a first air intake passage forming part and a first flange part, the first air intake passage forming part comprising a cylindrical part formed integrally with an engine main body mounting flange and a semi-cylindrical part formed so as to continue uninterruptedly toward an upstream side from an end face of the cylindrical part, and the first flange part protruding radially outward from the first air intake passage forming part;

the second main body section has a semi-cylindrical air intake passage forming part and a second flange part protruding radially outward from the semi-cylindrical air intake passage forming part;

the first and second flange parts of the first and second main body sections form the first and second mating parts with the gas passage; and

the air intake passage forming parts defining the air intake passages.

29. The engine air intake manifold according to claim 25, wherein

the flange parts between adjacent pairs of the air intake passages are formed integrally; and

the gas passages formed along the flange parts between the air intake passages are configured to introduce a secondary additive gas into each of the adjacent pairs of the air intake passages.

30. The engine air intake manifold according to claim 9, wherein

the air intake branch part has a valve mounting block disposed in a downstream portion of the air intake branch part; and

the gas passage is further formed by at least a portion of mating surfaces of the air intake branch part and the valve mounting block.

31. The engine air intake manifold according to claim 30, wherein the gas passage includes a first passage portion formed along the first and second mating parts and a second passage portion continues uninterruptedly to a downstream end face of the valve mounting block and opens into the air intake passages through a third passage portion formed in the downstream end face.

32. The engine air intake manifold according to claim 30, wherein the gas passage includes a first passage portion formed along the first and second mating parts and an additional passage portion disposed in the air intake branch part and communicating with the first passage portion, the additional passage portion being defined by an outside surface of the valve mounting block and a groove formed in an inside surface of the air intake branch part.

33. The engine air intake manifold according to claim 30, wherein the gas passage includes a first passage portion formed along the first and second mating parts and an additional passage portion disposed in the air intake branch part and communicating with the first passage portion, the additional passage portion being defined by an inside surface of the air intake branch part and a groove formed in an outside surface of the valve mounting block.

34. The engine air intake manifold according to claim 30, wherein the gas passage includes

a first passage portion formed along the first and second mating parts;

a second passage portion communicating with the first passage portion;

a third passage portion passing from an outside to an inside surface of the air intake branch part;

a fourth passage portion opening to the downstream end face of the air intake branch part and communicating with the second passage portion via the third passage portion; and

a hollow insert having a slit formed along an axial direction and being disposed in the third passage portion such that the

downstream sides of the fourth passage portion and the third passage portion are blocked and the fourth passage portion and the second passage portion are connected via the slit.

35. The engine air intake manifold according to claim 34, wherein the fourth passage portion is defined by an outside surface of the valve mounting block and a groove formed in an inside surface of the air intake branch part.

36. The engine air intake manifold according to claim 34, wherein the fourth passage portion is defined by an inside surface of the air intake branch part and a groove formed in an outside surface of the valve mounting block.

37. The engine air intake manifold according to claim 2, wherein the air intake branch part is further equipped with an engine main body mounting flange integrally with only one of the first and second main body sections.

38. An engine air intake manifold comprising:
main body means for defining an air intake passage; and
mating means for fixedly coupling two sections of the main body means;
the mating means being configured and arranged on the main body means to extend along an airflow direction of the air intake passage with a gas passage being formed by the mating means in the airflow direction of the air intake passage and opening into a downstream portion of the air intake passage to supply a secondary additive gas thereto.